T-sensors calibration: keypoints

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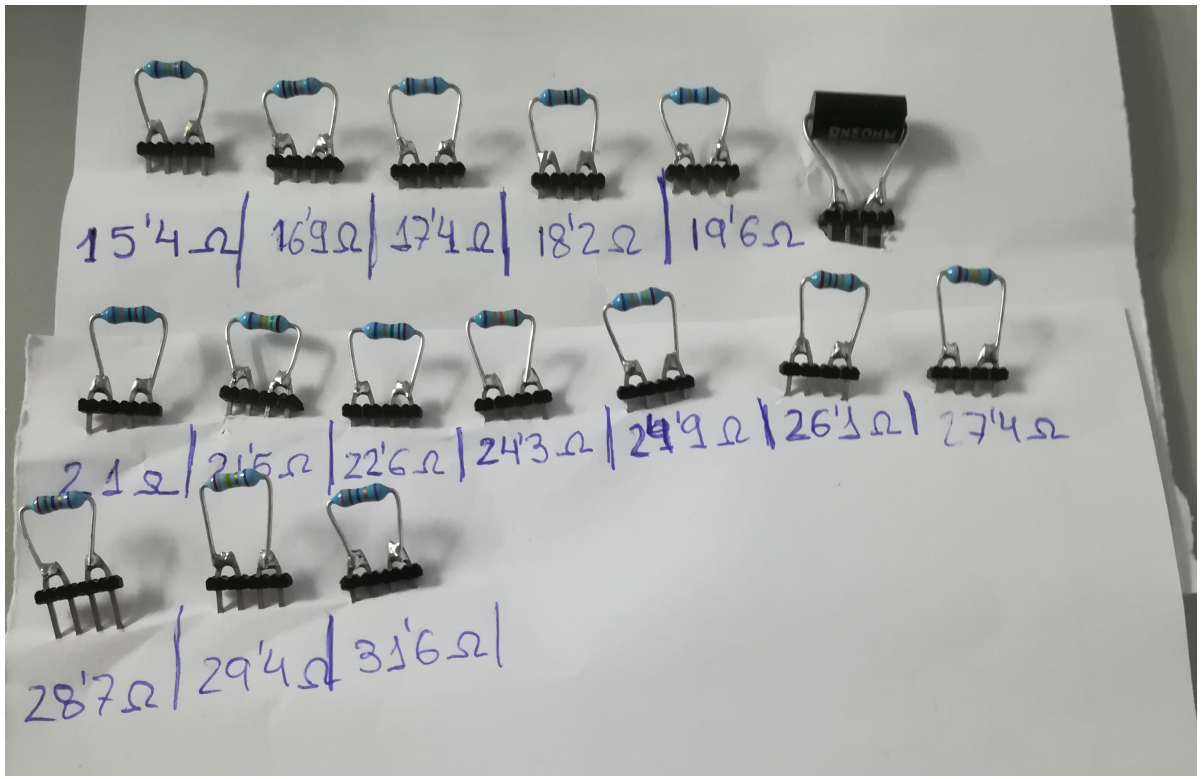
Outline

Main results from Anselmo

Trying to measure and confirm our suspicions

We have new resistors

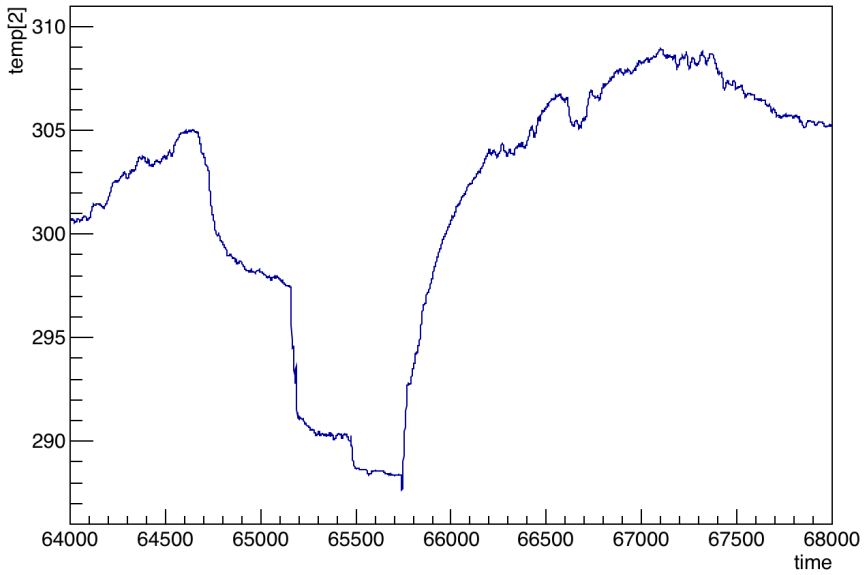
- We bought a bunch of higher quality resistors with much better tolerance (0.1% instead of 5%) and smaller temperature coefficient
  - ±0.1%, 0,25W, Axial, Serie R
- One of the resistors (20Ω) is even better (Coiled wire)



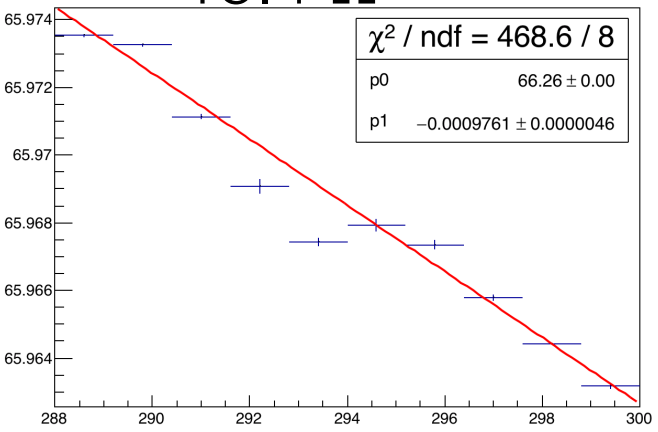
	Resistance	Tolerance	T eq
	15,4	0.1	65,9
	16,9	0.1	69.4
	17,4	0.1	70.6
	18,2	0.1	72.4
	19,6	0.1	75.6
	20	0.1	76.5
	21	0.1	
	21,5	0.1	
	22,6	0.1	
	24,3	0.1	
	24,9	0.1	
	26,1	0.1	
	27,4	0.1	
	28,7	0.1	
	29,4	0.1	
	31,6	0.1	

R vs T

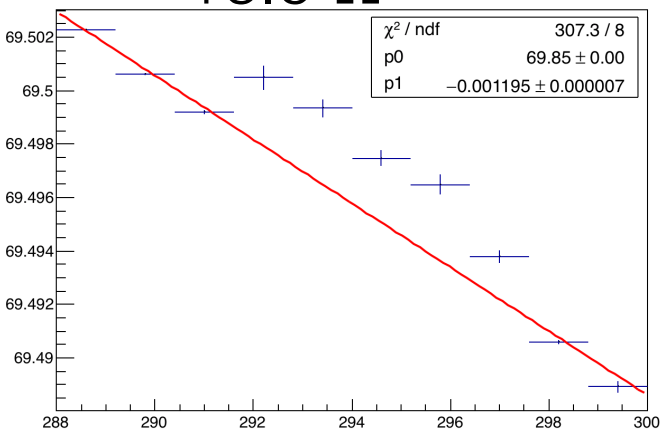
- Variation with the room temperature, affecting the source, and constant temperature for resistors (inside a box)



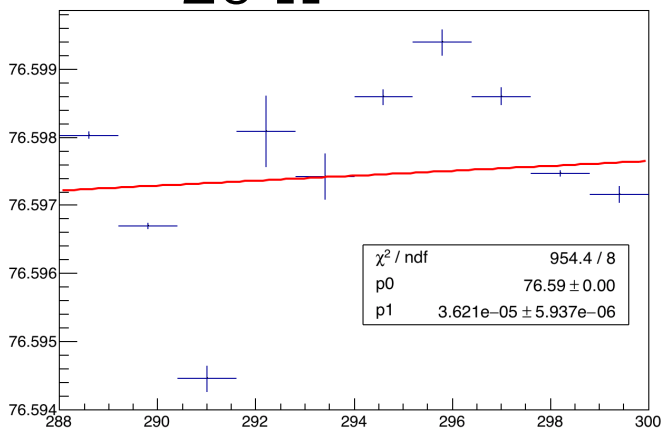
15.4 Ω



16.9 Ω



20 Ω

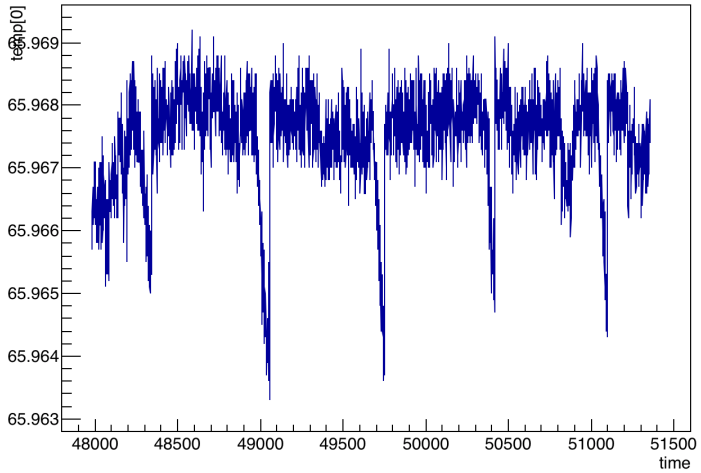


electromagnetic noise

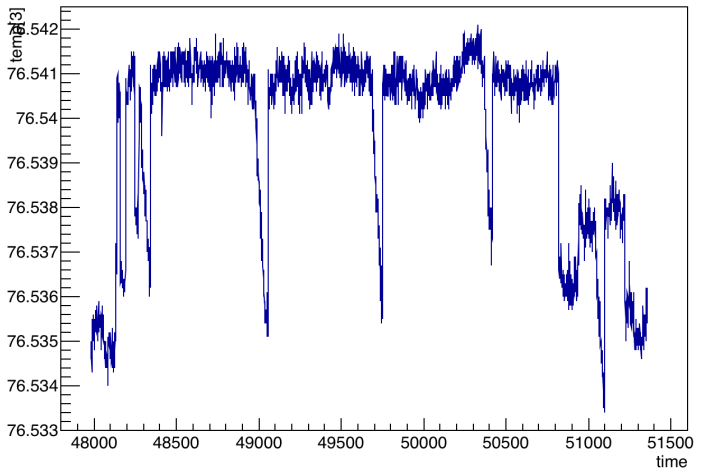
- Ch1 and 4 are correlated, lower noise in ch 2 and 3

I > 0

ch 1

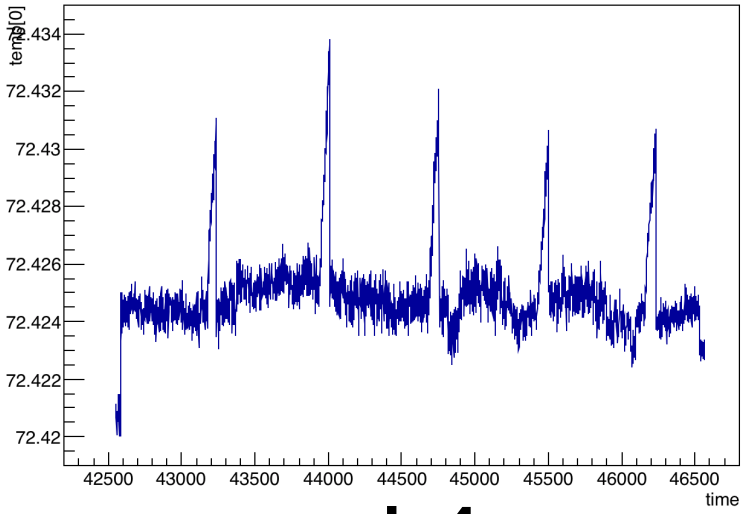


ch 4

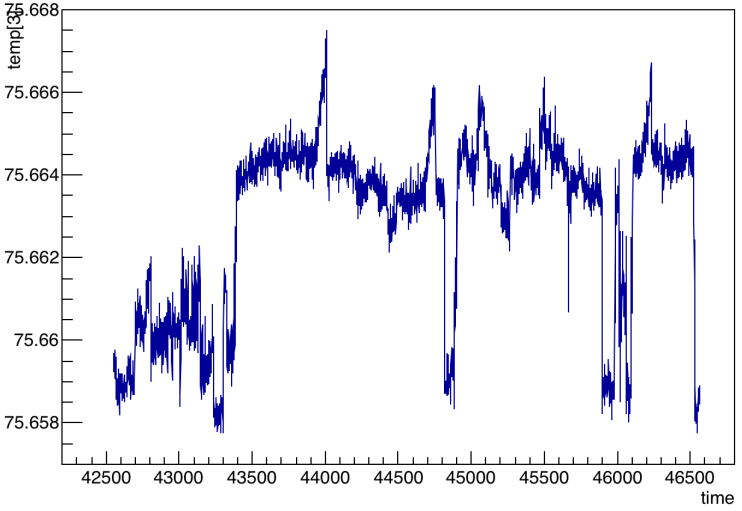


I < 0

ch 1

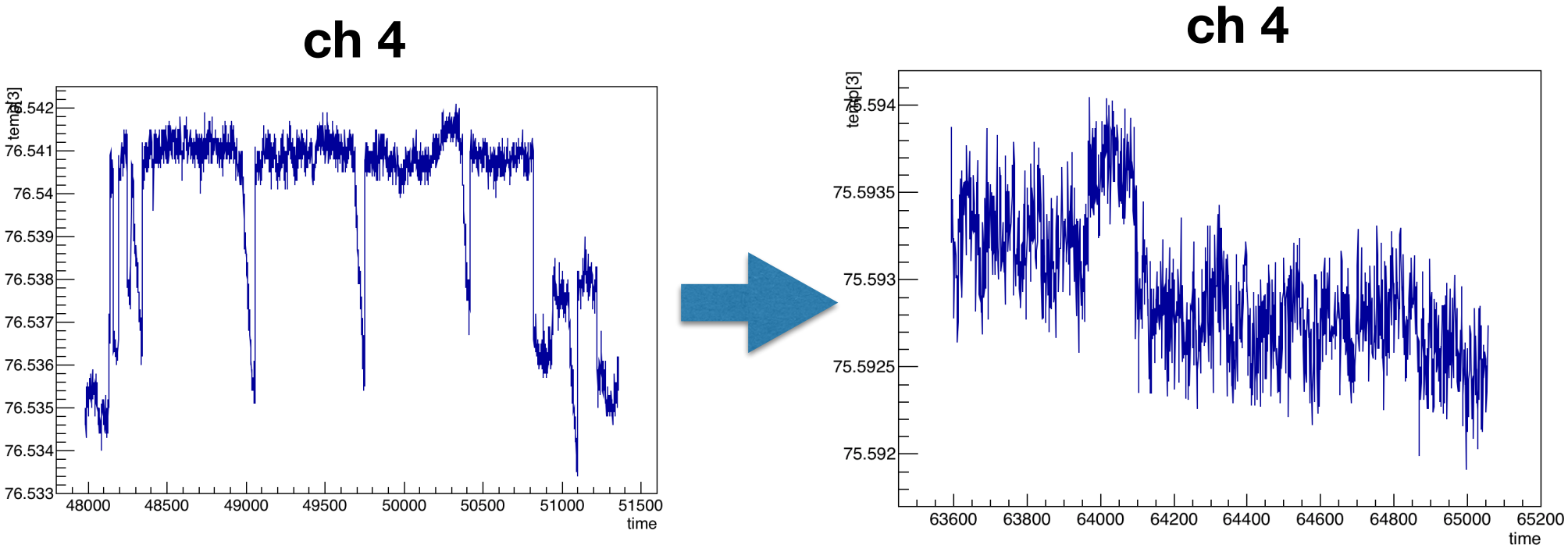


ch 4



electromagnetic noise II

- Try several things
- Move the current source far from everything. This seems to be the problem



Channel offset

- With this we are making a table with the channel offsets for each resistor
- The best reproducibility is achieved when switching the current sign continuously in the same measurement
  - This way the resistors are measured in similar conditions for both current signs

Ω	Ch4+	Ch4-	Ch4 offset	
15,4	65,9352	65,9959	**-0,0304**	
15,4	65,9359	65,9955	**-0,0298**	independ. polarity change
16,9	70,5392	70,5902	**-0,0255**	
16,9	70,5350	70,5935	**-0,0293**	independ. polarity change
17,4	69,4223	69,4736	**-0,0256**	
17,4			**0,0000**	
18,2	72,3940	72,4550	**-0,0305**	
18,2	72,3936	72,4555	**-0,0309**	
18,2			**0,0000**	independ. polarity change
19,6	75,5930	75,6544	**-0,0307**	
19,6	75,5932	75,6542	**-0,0305**	
19,6			**0,0000**	
20	76,5392	76,5912	**-0,0260**	
20	76,5633	76,5924	**-0,0145**	
20	76,5941	76,5329	**0,0306**	rapid change polarity
21			**0,0000**	rapid change polarity
21,5			**0,0000**	
22	85,6008	85,6528	**-0,0260**	
22			**0,0000**	
22,6			**0,0000**	
24,3			**0,0000**	
24,9	87,9894	88,0431	**-0,0268**	independ. polarity change
26,1			**0,0000**	
27,4			**0,0000**	
28,7			**0,0000**	
29,4	98,5424	98,6032	**-0,0304**	independ. polarity change
31,6	103,7793	103,8407	**-0,0307**	independ. polarity change

Things being done

- Compute offsets for all channels and resistors
  - confirm the non-dependence with temperature
- Can the temperature effect on the source be eliminated by the offset?

Further

- New chamber for cryogenic measurements arriving next week
- Relief valve has already arrive
- Complete calibration setup of our own